

REMARKS

Applicant thanks Examiner Olson for his time and consideration of the present application during the telephonic interview of May 7, 2010 with the undersigned.

During the interview a proposed amendment to claim the claims was presented and compared to the teachings of OKADA. The amendment included the addition of the allowable subject matter (branching enzymes extracted from unicellular algae) to claim 19, claim 45 and claim 46. Also Examiner OLSON maintained that claims 36 and 37 need further clarification, as they depend from the same claim but recite products.

Accordingly, this Amendment incorporates the allowed subject matter into claims 19, 45, and 46, and adds process features to claims 36 and 37 to distinguish these claims.

This application is now believed to be in condition for allowance.

Status of the Claims

Claim 19 now includes the allowable subject matter of claim 23. Accordingly, claim 24 was amended to depend from claim 19.

Claims 36 and 37 are amended to distinguish the claimed polymers from one another by the process by which they

are made. Support may be found, for example, in Example 1 of the present specification.

Claims 38 and 41 no longer recite E. coli as the branching enzyme.

Claim 45 now includes the allowable subject matter of claim 48.

Claim 46, now in independent form, includes the allowable subject matter of claim 50.

Claims 23, 43, 48 and 50 are cancelled.

Claims 19-22, 24, 31-42, 44-47 and 49 remain pending.

Claim Rejections-35 USC §112, 2nd paragraph

Claims 31-37 and 39-44 were rejected under 35 U.S.C. §112, second paragraph, for being indefinite. This rejection is respectfully traversed for the reasons below.

The Official Action maintained that claims 31, 34, 39, and 42 first recite a broad limitation of between 2.5 and 10% of alpha-1,6 glucosidic bonds and then follow by a narrower statement of the range/limitation: "wherein said soluble branched polymers of glucose in isolated and purified form comprise, at every 10 to 14 glucose units, an additional chain of glucose units".

The Official Action maintained that the narrow range of one side chain every 10 to 14 glucose units would, as the

branching enzyme introduces side chains as alpha-1,6 bonds, indicate that the branched starch contains between about 6.7 and 9.1% alpha-1,6 glucosidic bonds, which would be significantly narrower than the broad limitation recited in said claims.

However, the polymer naturally has alpha 1,6, branching points but not every 10 to 14 unit of glucose.

As a result of the branching enzyme, these branching points, however, occur every 10 to 14 units of glucose after an existing branching point. Before 10 units of glucose, branching is not possible because of steric hindrance. After 14 units, it exceeds the capacity of connecting of its active site.

The percentage of alpha-1,6 glucosidic bonds describes the quantity of such bonds overall, whereas the "every 10 to 14 glucose units" refers to the location of additional glucose unit occur, i.e., those which do not occur naturally.

Thus, features may be recited in the same claim without rendering the claim indefinite, as one feature refers to a quantity and another refers to a location.

Therefore, withdrawal of the indefinite rejection is respectfully requested.

Claim Rejections-35 USC §103

Claims 19-22 and 31-34 were rejected under 35 U.S.C. §103(a) as being unpatentable over OKADA et al. U.S. 4,454,161 (OKADA) in view of SENKELESKI et al. U.S. 5,562,937 (SENKELESKI) in view

of SANDSTROM et al. WO95/22562 (SANDSTROM), also published as BYRNOLF et al. U.S. 5,929,052 (BYRNOLF). This rejection is respectfully traversed for the reasons below.

Process Claims

The present process claims are amended to recited the indicated allowable subject matter, i.e., the branching enzyme is extracted from unicellular algae, or in the case of claim 38 the branching enzyme of *C. reinhardtii* and the branching enzyme of maize.

Therefore, the process claims 19-22, 24, 38-42, 44-47 and 49 are not rendered obvious by the proposed amendment, and withdrawal of the rejection relative to these claims is respectfully requested.

Product Claims

The Official Action maintained that the branched starch (alpha-glucose polymer) of SANDSTROM possess the same structural characteristics (size, degree of branching) as those described in the instant specification.

The Official Action acknowledged that the starches of SANDSTROM fails to disclose beta-glucosidic linkages, but the Official Action maintained that the presence of beta-glucosidic bonds in the compounds of SANDSTROM is an incidental result of the particular acid treatment used, and is not seen to be

necessary for the desired properties, namely stability and reduced osmolality, present in the starches of SANDSTROM.

SANDSTROM sets out to solve the problems associated with athletes need to store-up glycogen depots prior to strenuous activities or competitions. Prior to SANDTOM, athletes were forced to ingest large quantities of foods rich in carbohydrates in order to store-up sufficient glycogen, which was neither easy nor comfortable for an athlete. See, e.g., Page 2 lines 5-14.

To solve this problem, SANDSTROM provides carbohydrates in the form of a drink so that ingestion is easier and more comfortable in order to store-up glycogen, as well as promote the synthesis of glycogen to enable a larger amount of glycogen to be stored. See, e.g., page 2, lines 15-24.

The type of starch required by SANDSTROM a heavily branched dextrin starch. "It is assumed that the formation of glycogen is accelerated because the starting product is a long and branched polymer, such as dextrin." (Emphasis added.) See, e.g., page 2, line 1-4 and 25-31.

While OKADA is interested in increased branching so as to improve food including digestibility (lines 21-32 of column 2), SENKELESKI is directed is directed to a method wherein the gelatinized starch is enzymatically hydrolyzed "*with beta-amylase or glucoamylase until up to about 60% by weight of the starch has been degraded to maltose or glucose*" (Summary and

claims 1 and 7). That is, SENKELESKI, seeks to cut the main chain into short pieces: monosaccharides or disaccharides.

Thus, one of ordinary skill in the art would have been discouraged from modifying SANDSTROM (or OKADA) in view of SENKELESKI or SENKELESKI in view of SANDSTROM (or OKADA) as the modification would have rendered the digestion of the starch required by SANDSTROM (or OKADA) unsatisfactory for the intended purpose of helping making ingestion easier for athletes to increase glycogen storage (or improving digestibility) or rendered the product SENKELESKI unsatisfactory for the intended purpose of obtaining a mono or disaccharide.

Therefore, the proposed modification cannot render obvious the product claims of 31-37, and withdrawal of the rejection is respectfully requested.

Conclusion

In view of the amendment to the claims and the foregoing remarks, this application is in condition for allowance at the time of the next Official Action. Allowance and passage to issue on that basis is respectfully requested.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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